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# THE AGRICULTURAL STUDENT.

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## EDITORIAL CHAT.

The phenomenal development of the Ohio Dairy School during the past year is a splendid testimonial of the ability and energy of those having the work in charge. The number of students taking the work this year is exactly twice the number enrolled last year. Of the seventy-eight now taking the course, forty-six are special dairy students and twenty-six regular university students, while six are doing special advanced work. Not only has there been an increase in numbers but there has also been an increase in the quality of the students, the educational standard among them being higher than in any previous year. Professor Decker has this year inaugurated a new, and we believe a much superior system of laboratory instruction. Instead of putting the students directly to work on the separators and churns as has been the practice in the past, the first two weeks is being devoted to a systematic study of the mechanical construction of the machines and the methods of operating them to the best advantage.

We wish to remind our readers of the appeal made in our January issue for information in regard to the durability of binders, under the heading, "What Kind of Machine Shall I Buy?"





If you are the owner of a binder, sit down today, write out your experience with the different makes and mail it to J. C. Perry, Botanical Building, O. S. U., Columbus, Ohio. As every reader of *THE STUDENT* will receive the benefit of the information thus obtained, it is certainly worth a two-cent stamp and a little effort on your part.

We are indebted to McLaughlin Bros., of this city, for the cut of the prize winning Percheron stallion, which appears on our front page. In commenting upon their business prospect, one of the members of the above firm, says:

"Our record with our last importation which arrived the sixth of December, has been most wonderful. Since its arrival here every horse has been in good health, and although they have been here but a trifle longer than one month, they are already picking up, putting on flesh and are in the most thrifty and healthy condition. We never had such good fortune, and we think that our last importation in respect to healthfulness breaks all previous records.

In view of the fact that we do not have to consider loss; along with our other advantages, such as buying double the number imported by any other firm, being able to speak the French language fluently and thus dispensing with the services of an interpreter, we are not only able to offer our customers the best horses, but we are able to do this at prices no higher than our competitors must procure for inferior ones. These advantages are being evidenced by the fact that our business has increased three fold more this year than last."

#### News Notes.

The O. S. U. Naturalist, which began its existence last fall as a journal devoted to the natural history of Ohio, has changed its name. It will hereafter be known as the Ohio Naturalist.

*THE AGRICULTURAL STUDENT* exchanges of the magazine form will hereafter be found in neat covers on the racks in the reading room in Townshend Hall. Those in the newspaper form will be found in appropriate holders on separate racks.

A. W. Nettleton, '98, of Medina, reported the State Farmers' Institute and the meetings of the State Board of Agriculture for the Breeders' Gazette.

A long cattle-shed closed on three sides, has been erected as a south extension to the O. S. U. dairy barn.

C. B. Steward, of the Class of 1900, and a member of *THE STUDENT* staff, was elected secretary of the Ohio Short Horn Breeders' Association at their annual meeting held in Columbus, January 16, 1901. This is a well deserved honor, for Mr. Steward has for several years closely identified himself with the breeding of Shorthorns in Ohio.

Assistant H. C. Price, of the Department of Horticulture, has received the offer of a position as Professor of Horticulture and Dean of the Department of Horticulture in the Iowa State College of Agriculture. Not only is the position a responsible one, but it is one carrying with it quite a handsome salary. Mr. Price has not yet decided to accept the offer.

#### Meeting of the Agricultural Students' Union.

The seventh annual meeting of the Agricultural Students' Union was held in Townshend Hall Thursday evening, January 17. The meeting was called to order by President Ruhlen, who, after a few brief remarks, called upon the several section directors for a report of the work of their departments. Three of the directors were absent, but the remaining

four reported considerable progress in the work. Professor Selby, experimentalist of the Union, made a brief resume of the work of the entire organization. Mr. L. H. Goddard had been appointed late in the season to take the place of Mr. Bloomfield, as chief of the agricultural division. For this reason the work of that section was not so satisfactory as it would otherwise have been.

Professor Hickman, of the Ohio Experiment Station, was present and addressed the meeting on the subject, "Agricultural Technique."

The treasurer's report showed a balance of more than two hundred dollars in the treasury.

The following officers were elected to serve for the ensuing year:

L. H. Goddard, President.

W. H. Gilmore, Vice President.

W. D. Gibbs, Secretary-Treasurer.

A. D. Selby, Experimentalist.

The old section chiefs were retained and are as follows:

Agriculture, L. H. Goddard.

Horticulture, F. K. Luke, Columbus, Ohio.

Dairying, J. W. Decker, Columbus, Ohio.

Apiculture, J. F. Cunningham, Cleveland, Ohio.

Soils, W. D. Gibbs, Columbus, Ohio.

Economic Botany, A. D. Selby, Wooster, Ohio.

Forestry, E. J. Riggs, Racoon Island, Ohio.

Any person who wishes to do some experimental work during the coming season should write at once to Professor Selby or to the section chief under whose division the desired work is to be found. The materials and directions for the experiments are furnished free of charge on condition that the results are reported at the end of the season.

### **Horseshoeing and Some Evils Attending Its Practice.**

With the advancement of civilization bringing with it ever increasing demands for more rapid transportation and necessitating the construction of solid, hard roadways and streets, which are serviceable at all times and seasons, has come the need of thoroughly protecting the hoofs of the animals employed as beasts of burden and for draft purposes.

While the foot of the horse is admirably protected by its horny capsule against all the demands met in a state of nature, it can not withstand the excessive wear occasioned by the severe and continued service demanded of this animal when put to the various uses for which he is adapted in modern civilization. It has long been the practice to protect the foot of the horse and his fellow creatures of the genus equus, by the application of an iron plate applied to its bearing surface, and known as a shoe. The trade of applying shoes is known as horse-shoeing or farriery, and is of more importance than many owners of animals are led to believe. While at one time the trade was wholly in the hands of the common smith, who, indeed, performed most of the coarse horse-surgery of the times, with the advent of veterinary surgery as a profession, scientific attention was given to this important branch of practice and has ever since commanded the attention of able men who have carefully studied the anatomy and physiology of the foot and the demands of rational and successful shoeing as applied to the protection of the hoof with the least possible interference with the physiological functions as seen in the normal unshod hoof.

The literature on the subject is extensive, embracing large and carefully written treatises and text-books by men who have mastered the subject both theoretically and practically.

In all the leading veterinary colleges a complete and thorough course affords instruction in the theoretical and practical details of the subject, embracing the shoeing of normal feet for protection and to adapt them for service under special conditions, as on slippery streets in winter, as well as to remedy some of the disadvantages of faulty positions of the limbs, and in some cases to cure or improve diseased or defective conditions of the hoofs or feet.

However, since as a rule, only the shoeing for diseased or defective conditions of the hoofs or feet, comes under the direct supervision of the veterinarian, it is a matter of satisfaction to the owners of animals, that the splendid opportunities for instruction, which are now afforded in the schools of shoeing and in private courses, are being embraced by many of the intelligent smiths in whose hands for the most part rests the practical application of the principles of scientific shoeing.

Since the subject of horseshoeing is a large and important one and even a synopsis of the details of its principles and practice is beyond the scope of this article, it will suffice here to call attention to a few of the more prominent evils arising from a lack of knowledge of the structures and functions of the foot and its several parts or the disregard of them on the part of the smith when applying shoes to the normal foot.

The hoof of the horse is the representative of the claws and nails of other animals. The last bony segment of the limb is expanded to form a foundation for the hoof and this foundation is increased by two plates of cartilage which are situate laterally and posteriorly to this bony part, the cleft between them being occupied by a fibrous and fatty body. Over this foundation the skin of the limb is continued and variously modified to form different structures of the

foot. The derma of the skin of the limb has become the pododerm of the foot, and completely surrounds the internal structures above mentioned, secreting the external horny parts which correspond to the epidermis of the skin of the limb. The horny capsule thus formed and known as the hoof is tough and elastic, and in the living animal forms one continuous piece, but after maceration may be separated into the crust or wall, the sole, and the frog portions. Now, not only the lower edge or bearing surface of the wall portion of the hoof should support weight, but also the frog portion, which covers the above mentioned fibro-fatty body or cushion and occupies the center of the posterior part of the foot should come in contact with the ground and form a part of the surface of support, serving, as it does, in virtue of its elastic nature, to expand the hoof at all times when weight is thrown upon the limb, and alternately, to permit a return of all the parts to their former shape and position when relieved of weight. If when weight is thrown upon the limb no support be obtained by the frog from below its compression and consequent lateral expansion will not take place. The interference with this important function of the frog brought about by faulty and bad shoeing and by the ruthless cutting away of its substance by ignorant shoers, is responsible for a majority of the ills of shod feet. When thus deprived of its functional activity, the frog becomes shriveled from disease, no longer serving its office of expansion and permitting a contraction of the hoof. Also the failure to give any support to the navicular mechanism leads to strains and inflammations of those structures, resulting in the so-called navicular disease. Various inflammations of the pododerm are directly due to cutting away and weakening the sole and the bars, especially



when associated with destruction of the functions of the frog. Laminitis or founder is sometimes attributable to the above causes. Corns or bruised sole, are expressions applied to inflammations and hemorrhages of the pododerm and are largely due to excessive cutting away and weakening the quarters, sole, bars and frog. Thrush is a diseased condition of the frog characterized by the collection of a dark colored, ill-smelling liquid in its median fissure or lacuna. It may be attributed to bad shoeing and excessive paring of the frog, thus causing its atrophy and disease.

Besides the diseased condition briefly noticed above, which follow directly and surely in the wake of the drawing-knife and rasp in the hands of the wrongly instructed and mistaken smith, the weakening and thinning of the protective coverings of the foot render it much more liable to accidental injury, such as picked up nails, bruises, etc., and when associated with bad shoeing, occasion various defects of gait, as forging, interfering, etc.

Many smiths rasp away portions of the surface of the wall as well as destroy the sole and frog, and when this destruction of the natural protective surfaces is associated with the consequent lack of exercise of the foot structures, their naturally large blood supply is diminished and the foot is subjected to a drying out process which is the great enemy of a sound hoof.

M. B. L.

The Kansas Experiment Station reports that Kafir corn is one of their surest crops in drouth and that it gives a good yield on the upland. They have had but one failure of the crop in eleven years.

### Selecting a Milch Cow.\*

Progress has been the spirit of our nation. The determination to make some advancement, to leave the world a little better than they found it served as a stimulus to the Pilgrim Fathers when they first landed on our bleak New England shore. That same desire to conquer the unknown led the first settlers across the mountains and into the vast wilderness beyond.

I have no doubt that many of the older men, and women, too, in the audience before me, could tell the younger generations many strange stories of perils and hardships encountered by themselves, their fathers, brothers and sisters in their efforts to find a home that they might call their own. How nobly they have done their work is fully attested by the five great states which they carved out of the wilderness of the old Northwest Territory, not the least of which stands our own Mother State, Ohio.

They did not travel in Pullman Palace cars, these early pioneers, but they came in their stout ox carts. Oxen were not the only draught animals in those days, either. Sometimes Old Brindle took her place in the yoke and besides furnishing the family with milk, butter and cheese, she assisted in getting the first small clearing ready for the hills of corn, beans and pumpkins.

Since that time there has been a wonderful improvement in every direction. Electricity and steam with all their various applications in the service of man, have been developed. The livestock of the farmer has shared in the same general improvement. Animals have been selected with a view to certain specific uses. The old cow that served her time in the yoke and supplied the family dairy at the same time, was

\* Delivered before the Tri-County Farmers' Mid-Summer Institute, Stoutsville, O.

all right and filled her place at that time much better than those finished monuments of beef that go to the butcher's block or the delicately organized little Jersey that graces the front lawns of your village and country homes, could have done.

Why, what in the world would they have done with a 300-pound butter cow in those days. Everybody kept a cow of their own. There were no congested centers of population, such as we have in New York City or Chicago to be clothed and fed. Methods of transportation were such that the perishable products of a dairy would never have found a market beyond the home in which they were manufactured.

We are told that "necessity is the Mother of Invention." I know of no industry to which this old adage may be applied more forcibly than that of dairying. With the improved facilities of transportation and intercourse, and the improvement in all kinds of farm and dairy implements there came a demand for an animal better adapted to the production of milk and butter than the common stock of the woods.

So you see it was not by mere chance that a butter queen of the world was produced when Pauline Paul made her phenomenal record of over 1000 pounds of butter in 365 consecutive days. Experience taught breeders who were striving to improve their dairy cattle that certain definite characteristics were common to the best cows of all breeds. So it happened that while the "Sage of Kirklevington" was improving the Shorthorns other men equally as skillful in the art of breeding and mating our domestic animals were at work improving our dairy breeds. Some worked in Denmark, others in Holland and the low countries around the Zuyder Zee and along the English Channel, still others carried on their work on the islands of

the English Channel, and still later the American breeder has crowned the efforts of all by the production of such dairy queens as Brown Bessie, Kitty Carol, Pauline Paul and the numerous family of St. Lamberts and others. But wherever they worked they seemed to come to the same general conclusion as to the form, type and temperament that goes to make a profitable milch cow. The later invention of the Babcock milk test has verified their judgment. Right here I want to say that if you wish to select a good milch cow to an absolute certainty you must use the scales and the Babcock tester. I care not how expert you may become as a judge of dairy cattle the work done at the pail will sometimes give your judgment the lie. Many of you can no doubt remember when all fat cattle were sold by the head or their weight guessed off and many men became very expert in their judgment on the weight of a steer, but still none of them could be absolutely correct and be sure of it. Now, nearly every stock raiser has a pair of stock scales on his farm and he knows to a certainty what his stock weighs and whether they are making him a profit or not. Just so it should be with the dairyman. He can not afford to be without a pair of scales and a Babcock tester if he wishes to know just which of his cows is making him a profit and which is depending on the bounty of her neighbor for support. I realize, however, that for the man who only keeps a family cow or two and quite often for the dairyman it is not practical to test the cow before buying her.

He must depend on external characteristics to guide him in his selection. Now let us see what this milch cow should look like.

Somebody will ask how large is she; well, I don't care how large she is provided she has lung capacity and stom-



ach capacity in proportion to her size. Of course, you don't want to support any more animal body that you can help but you must have something substantial to support your machine, if you expect lasting results. The best milch cow will not necessarily be beautiful in outline. She will not have the slick, rounded, well kept appearance of the beef animal. Many would no doubt pass her by for that very reason. The milch cow is usually rough in appearance, not because she is poor, but because of her conformation. Her corners are not rounded off like the beef cow; she is sharp and angular in outline. When you view her from behind she should present a wedge-shape from her hip bones to her head. So also, when you look at her from the side the line of her back and her bottom line from her udder forward should form a wedge, if the lines were projected beyond her head. Then if you look down over her the spine should form the edge and the ribs the side of an imperfect shaped wedge.

From measurements taken of the prize winning animals at the World's Fair, it was found that the dairy animal and the beef animal were of about the same length, but the dairy animal was not near so thick or deep as you neared the front end. The reason for this is that in the dairy animal you want to support as little surplus body as possible, and this object is best attained by the wedge form. The digestive capacity of the cow is limited and you want to devote as much of it as you possibly can to the use of the mammary glands. Then your cow should be of fine quality. That is you want clean, strong bones, not large and coarse. The tail bone should be long and slim, indicating firmness and compactness of bone throughout the entire framework.

The back should be sharp and well defined, not covered over with a layer of

fat, but you should be able to distinguish every vertebrae as you pass your hand back over the spine. The ribs should be well arched, large and wide apart, so that you can count them without any difficulty. You should give particular attention to the spring of the ribs. They should form a good, large, round barrel, giving plenty of room for the respiratory and digestive apparatus to work.

The distance from the point of the hip to last rib should be relatively wide, indicating an openness of conformation and giving her a broad, long loin.

The pelvic arch should be strong and prominent, thus obviating misfortune at parturition and indicating a strong, robust constitution. The hips should be wide apart and the rump long, with a thin thigh, cat hammed, the butchers would say. In general the conformation of the hind quarters should be open and prominent, giving ample space for a large udder.

The withers should be lean, sharp and well defined. The shoulders light and running obliquely. Her neck should be thin with a well-defined throat latch and not thick and beefy. The head should be rather long, with a powerful muscular development of the lower jaw, indicating strong digestive apparatus. For the same reason the mouth should be large.

There is no question but that there is a correlation of parts, therefore I like to see a good, large nostril, because we may then expect a big lung surface.

Quite often we hear the expression: "That man has a bad eye," and it is a fact that a man's character is reflected in his eye. The same is true of the dairy cow. Her eye should be large, bright and prominent, having a mild, trustful expression and with plenty of width between the eyes, allowing a good broad forehead.

The ears should be fine in texture, with a rich, yellow secretion within indicating good quality.

The temperament of a dairy cow should be an important consideration. You don't want a cow that jumps out of her lot every time a stranger peers over the fence. We usually say that such a cow is a little nervous. No, she isn't. She has no nerves. You want a cow that has nerves, good, strong ones, too, and well under her control. Such a cow will have the courage to protect her calf and not go into hysterics with the effort either.

We hear a great deal about the quality of a cow. It is something that will be pretty hard to describe in words. When you take hold of the skin of a good dairy cow it should be loose and supple and should roll up under your fingers like chamois, skin giving it an oily, silky feel. The secretions of the skin should be a rich, yellow, indicating good quality in her milk. Now you will find that the quality of the hair and skin depends very much on the breed to which the cow belongs. A quality that would be very fine in a Holstein-Friesian would be judged decidedly coarse in a Jersey because breeders of the black and white cattle have not paid so much attention to quality and do not attach nearly so much importance to that point as the Channel Island breeders.

The cow's udder should be large and well formed, but examine it carefully for spoiled quarters and see that it is not meaty, but it should milk out loose and flabby. The hind quarters should be attached well up behind and the udder should describe a semi-circle. The front quarters in particular are very hard to get perfect. They should not be cut up in front giving the udder the appearance of having titled backwards.

The front quarters should attach well forward on the abdomen and be well let down so as to carry the general wedge outline of the body. I like to see a prominent net work of veins over the surface of the udder indicating a plentiful supply of blood. The teats should be of good size and evenly placed, not buncy or warty and having small accessory teats to interfere in milking.

The milk veins should be large and elastic to the touch. They should be long and tortuous in their course, with prominent connecting branches. The milk wells through which the veins pass into the abdomen should be large.

Now I have endeavored to touch upon those points of the most importance, which I think you should consider in the selection of a milch cow. You can afford to overlook some of them though, if the cow under consideration is particularly strong in three points. I want to impress upon your minds the importance of these three points. First, a good lung capacity; second, a good digestive capacity; and third, a good mammary development. If she is expected to give a large flow of rich milk she must have a large udder with a bountiful blood supply to carry the food which she digests. This large amount of blood must be purified hence the necessity of good respiratory apparatus.

Now, having found such a cow, you cannot afford to treat her indifferently. She is worthy of the best care and feed and she will repay you many fold for the extra care and attention which you may bestow upon her.

C. B. STEWARD.

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Pure food laws are good only when enforced by men who are fed on pure, moral food.

### The Feeding of Dairy Cows.

The dairy business is receiving more attention from the farmers now than ever before.

It is now one of the leading branches of agriculture and is rapidly increasing. The amount of capital invested is rapidly increasing and is destined to increase more rapidly in the near future. The best proof of this is the large number of schools, devoted to this subject, that are already organized. Most of the agricultural papers have a department devoted to the dairy, while there are several papers devoted exclusively to dairy interests.

The future of this industry depends on the cow, and her future depends on the treatment she receives. Under the care of careful breeders, and with the better methods of breeding, she has improved greatly. Yet, when we consider the care and surroundings of the average cow we find them far from ideal. Few persons seem to realize what they owe to their servant, the cow. Many seem to think that a shed or stable that is not much better, and enough to fill up on, regardless of quality or composition, is all that is necessary. Some have little or no idea of the food required. To illustrate, not long ago I was told by a buyer, who agreed to furnish his neighbor with a cow, that not long after the cow was furnished, the complaint was made that after the first day or two she only gave a quart of milk. When asked if they fed her well, they replied: "Yes, we give her a quart of bran twice each day in a pail of water." Of course, this is an extreme case, but shows something of the ignorance that exists. In order that a cow do her best she must have the best of treatment. We do not expect a machine to turn out its maximum product unless it is in the best of condition and furnished with the best of ma-

terial. The dairy cow is a machine, the food is supplied and she turns out the finished product. One reason why so many cows do not pay is because their owners expect something for nothing. She must be supplied with the material from which to make the milk, or she can not make it.

The quality of the food is a very important factor. If we should take corn to the mill, in the shock, we could not expect as much meal or expect it as soon, because more time and labor would be required and more would be taken for toll. Just so with the cow, if we feed too much coarse, improper food, more time will be required in consuming same amount and the product will be proportionately less, because more will be required to maintain the cow through a large time, and more will be used up in the way of masticating and digesting.

The cow requires only so much to keep in good condition. All food consumed beyond this goes to the benefit of the owner and is eaten free gratis by the cow. The greater this surplus eaten the greater the profits to the owner.

The more palatable the food the greater the surplus eaten. Cows have tastes as well as man, and their tastes should be gratified. Moist succulent food is eaten with greater relish in greater quantities than dry food. Some such food should be supplied the year round. In winter ensilage, roots, slops, etc., may take the place of green foods in the summer.

Such food has a tendency to keep the bowels loose, which is a great factor in digestion and in keeping the animal in a healthful condition. Palatability depends, too, largely on the freshness and purity of the food.

Impure, moldy or damaged materials, may give rise to a poor product and endanger the health of the animal. The



mangers and feed boxes should be kept free from old feed, which is a good means of spreading disease, and rapidly decays. I have even seen large numbers of magots in feed boxes, enough to prevent any cow from eating half her feed. The feeder must study the individuals of the herd and cater largely to their tastes. This applies especially to fine herds or show cattle. In some of the fine herds of the east, the cows are tested and fed a ration, the quantity, quality and composition of which is best suited to their needs. Much may be done in the way of educating their tastes. Few cows will change readily from one ration to another that is radically different. It is often some time before they will eat a full ration and in the meantime the flow of milk is decreased and may not be brought back to what it was before changing rations.

The composition of food materials is a very important factor in feeding. The truly successful feeder must have a knowledge of the composition, digestibility and nutritive ratios of food materials.

There are two classes of nutrients, the carbonaceous, or carbohydrates and the nitrogenous, or those containing protein. By digestibility we mean the per cent. of these nutrients, found in the materials that are digested or assimilated by the animal. When we speak of the nutritive ratio of a substance, we mean the relation existing between the digestible carbohydrates and the protein. If we say a certain food has a ratio of one to five we mean that it has one part of digestible protein to five parts of digestible carbohydrates. The carbohydrates enter largely into the production of fat and energy, or work, and are required in larger quantities than protein, which enters into the formation of muscle and other tissue. A cow weighing one thousand pounds and not in milk

requires (according to the Wolff-Lehmann standard) less than one pound of protein and something over eight pounds of carbohydrates, or a nutritive ratio of one to eleven.

Protein or albuminoids enter largely into the composition of milk, hence, it is required in larger quantities by the cow producing milk. A cow producing 20 to 25 pounds of milk daily requires about  $21\frac{1}{2}$  pounds of protein and 13.5 pounds of carbohydrates, a ratio of 1 to 5.7. This should be varied according to the weight of the cow and the milk produced. The former is a wide ration and the latter a narrow ration. If too large a proportion of carbohydrates are fed, fat will be laid on at the expense of milk production. A cow can not make milk unless supplied with the materials from which to make it; hence, if protein is short in the ration the milk supply will be short, regardless of the quantity of carbohydrates. Hence the value of a "balanced" ration. In compounding or balancing a ration the animal to be fed must be considered. If a fattening animal the ration may be wide, if a milk cow it should be narrow.

Protein is the most costly part of feed, hence it is desirable to feed no more than is necessary. Any more would be a waste and would be thrown off by the animal as a waste product. The carbohydrates are comparatively cheap, yet there are reasons why an excess of these should not be fed. There might be a saving, as far as cost of feed is concerned, by feeding larger quantities of carbohydrates in order to get the proper amount of protein. Yet, by this method the animal is required to do an extra amount of work in consuming this extra carbonaceous food. This extra work will be done at the expense of milk production. So much is required to maintain the body and do the necessary work; all that is assimilated above this, will

go to form milk or fat. Therefore, a properly balanced ration is economical, not only in cost of food, but in requiring the animal to do the least amount of work to get the required nutrients.

The compounding of rations must be left largely to the feeder. Many valuable rations have been given by agricultural papers, but these will not meet all demands.

Hardly two sections of the country produce the same kind of food materials, and the rations must vary with the kind of material raised. Most of the crops produced on the farm have a wide nutritive ratio. The protein must be supplied from some material rich in protein. This may be furnished by the use of clovers, alfalfa, oil meal, oil cake, gluten meal, gluten feed, malt sprouts, etc. While a knowledge of the composition and quality of materials is of incalculable value to the successful feeder of dairy cattle, he must study his herd, their individual requirements and characteristics and deal with them accordingly. The same treatment and food given to two animals may produce widely different results. C. C. H.

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#### **Aggressive Character and Economic Aspect of the White Heath Aster.**

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The White Heath Aster (*Aster eriocoides*) is an indigenous species whose distribution is given in our manuals as "Canada, Florida and the Mississippi," "Maine and Ontario to Florida, west to Wisconsin and Kentucky," and "South New England to Minnesota and southward," the variety *pilosus* "mainly in the Western States." It is one of the commonest Asters throughout Ohio, occurring doubtless in every county in our State. The variety *pilosus* seems to be the common form in our region, and

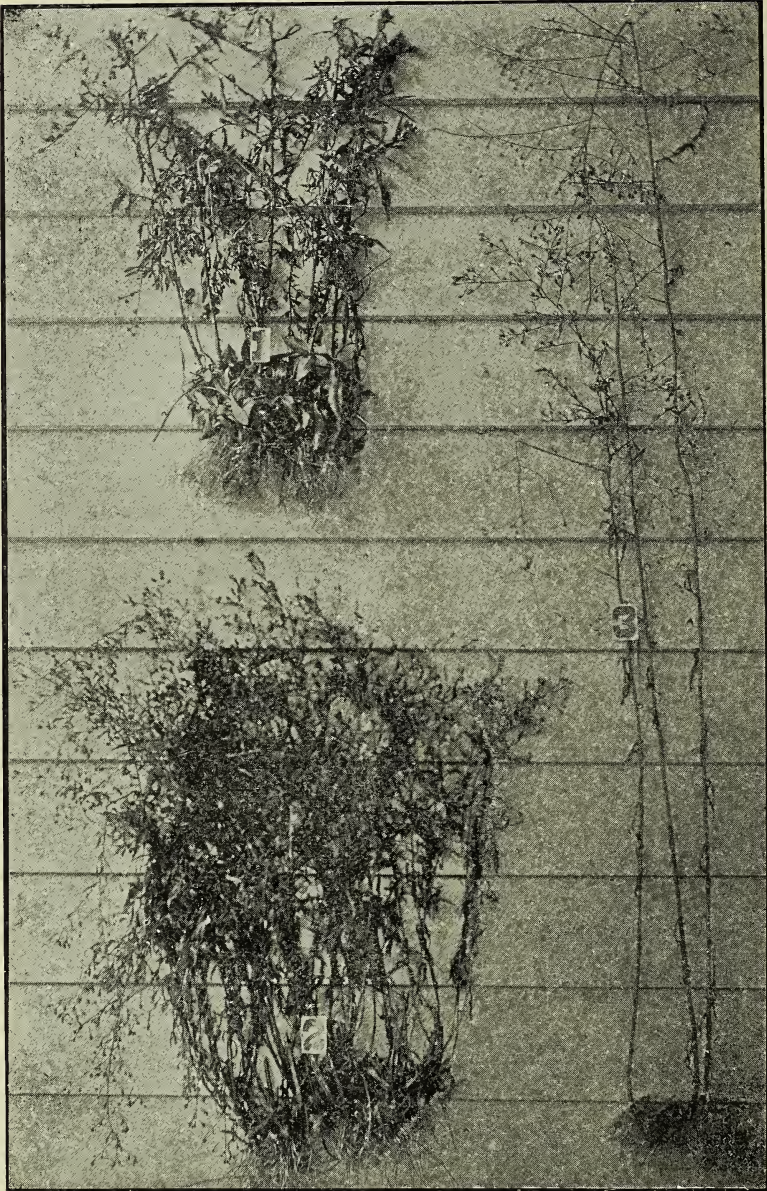
may be seen growing in rich and poor soil with almost equal thrift, and occurring in all habitats except the woods and swamps.

Its capacity for adaptation to the advance of civilization is remarkable, and this occasions the remark now very generally heard among the farmers that it is a "new weed in the region," "not known here five years ago," "just came all at once," "the latest and worst weed we have," and other expressions of similar import. As a matter of fact, the roadsides in many places are lined with it, fields with a poor stand of clover, timothy, or blue grass are completely covered with it, and all waste places, vacant lots, and neglected spots are profusely decorated with the same.

The plant is a rather coarse weed; but in spite of this fact it is somewhat attractive because of the masses of green foliage and the white flowers that become prominent before the summer is gone, and last throughout the early and middle autumn. The stems are tough and wiry and this gives the local name "Steelweed," a common designation in Adams County and adjoining regions. It is said by some, however, that this name is given it "because the flowers are the color of bright steel." Another name frequently applied in the localities mentioned is "Bee-plant" for reasons suggested in the name itself, and still another is "Stickweed," for which I could learn no explanation. Other common names which Britton enumerates are Frost-weed, Michaelmas Daisy, Farewell Summer, White Rosemary, Dog-fennel, Mare's tail and Scrub-bush.

Though complaint against this plant is universal in some sections, it is not, I think, well founded in all cases. It has some merits now and then acknowledged by those who are close observers. The allegations pro and con may be summarized as follows:





*Aster ericoides pilosus*, reproduced from photographs taken late in November. Figures 1 and 2 show plants with abundant, and Figure 3, with few young shoots near the ground. Plants in Figures 1 and 2 had the tops removed in summer. Figure 3 shows the common appearance of undisturbed plants at the end of the growing season.



First, the statement is made that it is "driving out every other grass" and "invading" the whole country. It is certainly more abundant than it was before the country was cleared and cultivated; yet after all but little of it is seen in good pastures and vigorous meadows, and none at all in ground that is under thorough and constant cultivation. It has not the aggressiveness possessed by some of our weeds, but it does quickly take possession of neglected and fallow ground. It does not spread extensively or rapidly by underground stems as do some of the Compositae. It has simply short rootstocks for this purpose. Its mode of multiplication by this means is illustrated in the figures shown in the accompanying plate.

These are from photographs taken late in November; and indicate the preparation the plant makes for the next season's work. The specimens numbered 1 and 2 had been mowed to the ground during the summer. But this, instead of killing the plants stimulated their propensity to vegetative multiplication. The result was, therefore, the opposite of what the farmer intended. Figure 3 shows a plant undisturbed during the growing period, and its energies active and latent were almost entirely exhausted in producing flowers and seed. Let the plants alone then rather than shear their tops, and the sooner will exhaust themselves.

It is true, as the figures plainly suggest, that this Aster is not a difficult one to eradicate. While the roots are numerous, they are not long; and even the shallowest plowing or ordinary cultivation will effectually destroy the plant. As to multiplication by seed germination, it needs simply to be remembered that good or even fair cultivation of the soil will prevent this weed from growing, and that many species of weeds will get in old meadows and pastures as rapidly

as the cultivated grasses are killed by excessive grazing or the casualties of season and climate.

In the second place the weed is charged with the heinous crime of "killing stock." Thorough inquiry in different localities established the fact that this plant, eaten to considerable extent late in the season by cattle and horses it is true, does damage perhaps only as the consumption of an excessive amount of almost any kind of dry and comparatively innutritious vegetable might do. It is said to be especially binding, and the constipation no doubt was a factor in bringing about the fatal results that were cited. While stock will eat the plant when at hand they take but little of it if nutritious grasses can be found. A very intelligent and observant farmer, however, was seen cutting and burning the plants which covered his pastures to save his stock—his neighbor by carelessness in this respect, he averred, having lost some valuable horses.

On the other hand this White Heath Aster is an important bee-plant. Bees will "work on it the whole day," and the plant is in bloom from middle or late summer to late autumn. The honey made is white, and has a strong tendency "to turn to sugar." One farmer who has two hundred and fifty stands of bees, now that this bee-plant is well established as a sure crop, will sow no more buckwheat for his bees.

I have said this species is becoming excessively abundant in some (hilly) portions of southern Ohio. It can well be regarded as "a great boon" merely because it is a soil-binder of marked efficiency. It prevents the destructive washing of the hillsides in the Fall, open winter and early spring. Such a plant would not be needed to a great extent, were methods and habits of cultivation perfect or in a high state of development; but this phase of the economic as-

pect of the case must at présent be insisted on.

Finally it may be said that as a fertilizer this Steel-weed takes a high rank. It is regarded by observant farmers as but slightly inferior to a crop of clover. It does not decompose when turned under as quickly as clover, but that it yields plant-food and answers well the mechanical purposes of a coarse fertilizer, testimony is unanimous and apparently conclusive.—PROF. A. W. KEL-  
LERMAN, in *O. S. U. Naturalist*.

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### Agriculture As a Business Undertaking.

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As, primarily, the nation is moulded at our firesides, so, also, is our nation's commerce influenced and governed by our farms. The nation, its commerce, its industries, its wealth and prosperity depend largely upon our agriculture—upon the farmer himself. Take every vestige of agricultural products from the nation and its commerce, even for one day, and mark the result. Completely remove both its products and supplies—the imports as well as the exports of the farm—for a month, a week, and the almost total collapse would astonish as well as surprise us. The people of our cities of every class depend upon the farmer for their very life—and yet how few of them who know him and his work, who appreciate his really great importance in the very every-dayness of their physical lives. And, on the other hand, how deplorably few of the farmers who really know themselves, who recognize their opportunities to appreciate the strength of their position as a factor in the integral mechanism of our government.

With every year of added population, newly discovered methods and increasing competition farming becomes, to the average farmer, more and more a fight, a struggle, a problem. The problem is

somewhat solved, the struggle resolves itself into a simple task and the application of modern methods, processes, arrangements, plans and appliances with the farmer who has studied the principles involved in successful latter-day agriculture; and they are, therefore, to a certain extent, able to meet its principal requirements and demands. It is the farmer who tries to keep up with the procession by following the old-time methods of his grandfather's day, who discovers that farming don't pay, and who practically makes little more than enough to keep soul and body together. He ridicules "book-farming," ignores the farming journals, has little or no use for the Station Bulletins and the "new fangled" notions he hears taught at the Institutes—providing he goes to hear them—and is skeptical regarding the good of Agricultural Colleges. It is the new farmer, the man born of the demands and necessities of the times, that goes about the forming of his plans much as does the commercial man of business, who maps out and outlines the year's operations upon definite lines and with an accuracy and positive knowledge of each element that will, from time to time, enter into the consummation of the work before him, that somewhat insured him against the ordinary causes of failure; barring, however, those elements and combination of elements over which man has no control.

To such men as these farming has become, in fact, a rigid business proposition, of such vital importance as to secure their most intelligent care and attention. To the end of accruing the highest results he deems it necessary to devote thought, study, careful investigation and research in an endeavor to become educated in his business; much as do the successful business and professional men in the line of their respective business or profession. A certificate of admission

to practice does not insure success to the doctor or lawyer; he builds his practice and maintains it upon a broadening information gained by consent, earnest study of every one new item material to his work, of every up-to-date method and means to an end that is brought to his notice, or that he may discover in his continual study and experience. The degree of his success depends largely upon the volume of his knowledge and experience—as does also that of the farmer. Farmers to be successful should be well qualified to meet every demand made of them in their work—to be master of every situation. There are such men in the agricultural field today; men of tact and practical resources, of ability and intelligence, schooled and experienced in modern methods, competent to conduct all business transactions incident to the business-like management of a modern farm in every detail, and of directing all its complicated operations; in short, men of business brains, skill and talent; men qualified to cope with the exigencies of the moment; every ready with an efficient expedient to meet every contingency that presents itself; keen to appreciate every transient opportunity, and clever enough to apply it advantageously; whose better judgment can anticipate general results without making costly and nonsensical experiments; capable of practically and conservatively planning a season's work before a stroke of labor is performed upon it, and of devising the best means for the successful consummation of his ideas; who can handle labor and secure the best results therefrom without either driving or coaxing men; men who are acquainted with their business along business lines, and prepared to carry it out in a business way. These are the men who by close, careful thought, study and investigation have acquired a practical knowledge of

natural laws in Agriculture as related to their application to modern farming. These are the men who will tell you that farming does pay; who can prove to you that it does, and can tell you how such results are accomplished. These are the men whose names appear from time to time in the Agricultural press—whose teaching it will pay you and I to follow, in so far as their systems and methods are applicable to our individual cases and conditions.

There is hardly any business that I know of that should be entered into with more caution, discretion, experience and a full knowledge of governing conditions than that of establishing or maintaining a modern business farm of any kind, whether farming, trucking, gardening, dairying, stock raising, or what not. It requires a familiarity with both the laws of nature and of commerce. First, the foundation must be laid for crop production, and that thoroughly, before maximum results can be secured. To have a garden, for instance, we must have every condition favorable for vegetable production; and, usually, these have to be made. If it is poorly or improperly prepared we will have a poor garden accordingly; no matter what skill is brought to bear. If well and thoroughly prepared, a good garden may be maintained, providing it is properly handled. Lacking this combination, failure results. The farm, however, is not the only consideration in the premises, but its indirect as well as immediate surroundings. In intensive cultivation to know the demands of certain markets within a limited freight shipping area directly point out to a man who makes a study of his business environments the particular products to produce to the best advantage. To be depended upon in this matter his experience must be somewhat extended, and his study of the mar-



ket requirements must be as careful and constant as that of the process of production.

I know from an acquaintance with such men and their methods and ideas, that such a study of conditions and environments, such an education along modern lines, such a knowledge of the whys and wherefores of success and failure in their work, both as growers and business managers, that modern farm education does pay, and handsomely. On the other hand, I know just as well that ignorance, prejudice, a lack of interest and practical judgment in the application of modern principles in agriculture results in failure.

The urgent need today is for more and more of such practical, up-to-date, modern farmers. The time is apparently far distant when the modern agricultural education of the farmer will be universally adequate to the urgent requirements of the present and the coming day. The fault, however, is with the farmer himself, and not the educator. The sources and volume of educational advantages increase in proportion to the need of the farmer. It is because the farmer does not take advantage of his opportunities that he finds himself unfitted to meet the increasing demands made of him in his work. In fact there is hardly any other class on whom is expended more time, energy, intellect, experience and money for his public education. The State Experiment Stations, with their free bulletins; the Farmers' Institutes, conducted by the best agricultural talent to be had; the Agricultural Colleges, for the higher education of those that are, or should be, our agricultural teachers, and last, but possibly, greatest of all, the Agricultural Press;

all teaching, instructing, directing, guiding, educating. If the farmer is not benefited thereby it is for one of two reasons—that he is either not susceptible of development, or that he pays no attention to or rejects the advantages offered him. The latter class do not believe in Experiment Station work because "Experimentin' ain't farmin'"; in the Institutes, because "the In'stute fellers is paid to talk 'bout suthin' he don't know nothin' 'bout," probably for the reason that he has made application of some method there explained in a hap-hazard way and failed; in the Agricultural College, because what they pretend to teach is all "rot," nor in the Agricultural paper, because he don't believe in "book farmin'," and because he thinks that the articles are written by "them city fellers as don't know no more 'bout farmin' 'n his old muley cow." I have heard all these expressions repeatedly, and know that such opinions are common with that class of farmers last described.

I know, and am sorry to know it, as I said before, that the farmers' lack of education is with the farmer, and not his opportunities.

R. M. WINANS,  
Mentor, O.

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The soiling system cleans up the farm and more than doubles the acreage.

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The careless farmer's success is always accidental.

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'Twas not framed in gold or silver,  
Yet it rather took my eye—  
A very small boy on a big doorstep  
With half a pumpkin pie.

—Chicago Record.

The sale of oleomargarine is strictly forbidden in France. In the Paris markets it is not allowed to be brought into the butter pavilion on any pretext whatever. Any butters suspected of being adulterated are taken in charge and sent to the municipal chemist for analysis. Retail dealers are forbidden to sell any butter substitutes and it is a finable offence to have any of them on the premises.

To many the division between "foods" and "food accessories" is a hazy one, but there is a pronounced distinction, and the new science of dietetics makes the division plain. Foods must contain nutrients, while food accessories may or may not. A determination by rigid test that some of the most delectable of luxuries long classed as foods (the mushroom, for instance) are wholly wanting in nutriment, and proof that certain much maligned condiments (notably black pepper, when properly selected and prepared) contain peptic tonics which aid nutrition, are all in line with the inter-dependence of the two classes covered by the terms "foods" on the one hand and "food accessories" on the other.

#### **New Books.**

POLITICAL PARTIES IN THE UNITED STATES. Vol. I. By J. P. Gordy, Ph. D. Professor in the Ohio State University. Henry Holt & Company, New York.

The generous reception of the first edition of Professor Gordy's History of Political Parties, which was issued some years ago, has made necessary a second edition. Since presenting the first edition the author's views have changed somewhat in regard to the relation of Alexander Hamilton to the Federalist party. He now believes that the political views of Hamilton were held by a small minority of the Federalists who succeeded in de-

termining the policy of the country up to the election of Adams; and that these views finally led to the overthrow of the party in 1800.

The present work has been reconstructed in accordance with the author's changed views, and has been extended so as to embrace four instead of three volumes. The recognized authority of the author makes the history a valuable one for every student of the history of our country and its political institutions.

ROAD MAKING AND MAINTENANCE. By Thomas Aitken, C. E., President of the Road Surveyors' Association of Scotland. J. B. Lippincott Co., Philadelphia. Pages 440, with numerous plates and illustrations.

The book is intended as a practical treatise of the subject of roadmaking, for engineers and surveyors, and is divided into two parts. The first part treats of the making and maintaining of Macadam roads, while the second part deals with carriageways and footpaths. Recent inventions and improvements in the mechanical appliance for quarrying and handling materials, have rendered road construction more expeditious and economical. The present volume describes all the newer methods and gives numerous cuts of the latest mechanical appliances together with instructions as to their use. The information given in regard to the systematic making and repairing of roads, is largely the result of the author's own experience, which extends over a considerable number of years. An exhaustive index at the close of the volume renders any subject easily found and referred to, without delay.

MODERN BLACKSMITHING, RATIONAL HORSESHOEING AND WAGON MAKING. By J. J. Holmstrom. The Alhambra Book Co., Chicago. Cloth, illustrated, price, \$1.00.

This is the first book that has ever been written upon these subjects by a

practical blacksmith and wagon-maker. The author states that his book is fresh from the anvil; notes having been taken during the day while at work and compiled into articles during the evening. He has succeeded in getting into his book many valuable things that have never appeared in print. Every farmer who has a little shop of his own will find many valuable hints and practical suggestions in *Modern Blacksmithing*. The closing chapter is devoted to the treatment of diseases most common to horses, such as colic, bots, distemper, spavin and founder.

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SOILING, SOILING CROPS AND ENSILAGE.

By Frank Sherman Peer. M. F. Mansfield, New York. Cloth, illustrated; pages, 247.

Mr. Peer has produced a book which, if its advice was followed by the farmers of this country, would revolutionize many farm practices and bring success where failure has been met with in the past. The book is intensely practical and points out the lines along which the farmer of the twentieth century must work if he expects to gain a livelihood in the face of the fierce competition that is now being waged in every industry. The writer gives his own experience in conducting this system of feeding so that the reader may obtain a clear view of its workings and be enabled to adapt the system to the circumstances under which he is placed. The relative advantages and disadvantages of soiling are considered at some length. Rotation of soiling crops, barn construction, stable management, site building and growing and feeding ensilage, are some of the more important topics treated under separate chapter headings.

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QUINCY ADAMS SAWYER AND MASON'S CORNER FOLKS. By Charles Felton

Pidgin. C. M. Clark Publishing Co., Boston. 12 mo, cloth. \$1.50.

Mr. Pidgin has put forth a book with an atmosphere full of the country life and vigor of the rugged New England States. Quincy Adams Sawyer is a young man from Boston, who comes down to Mason's Corner for his health. He finds country life so interesting and a certain young lady so fascinating that he prolongs his stay for several months, mixing with the young folks and taking an active part in their rural sports. In the meantime he is putting forth his best efforts for the good of the village and finally marries the country girl of his choice, and is forgiven by his aristocratic parents. Those who were reared on a farm should read the book, for it will revive pleasant memories and recall many scenes of their youthful days.

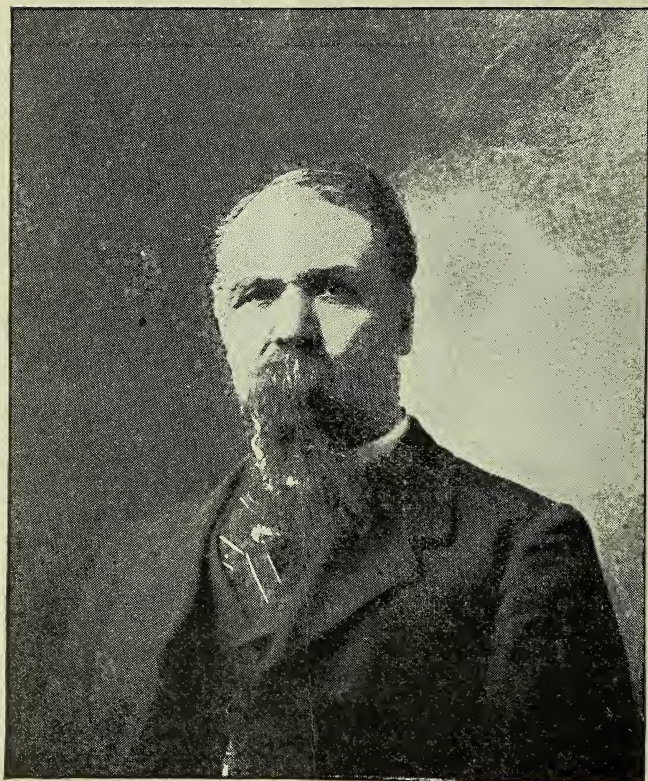
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ANIMAL LIFE. A FIST BOOK OF ZOOLOGY. By David S. Jordan, President of Leland Stanford, and Vernon L. Kellogg, Professor in Leland Stanford University. D. Appleton & Company, New York. 12 mo. Cloth.

Animal Life is the latest volume of the twentieth century text-books, which the Appleton Company is publishing. The authors present the book as an elementary account of the relation of animals to their surroundings and their responsive adaptation to their environment. The student is shown that this adaptation of animals to their surroundings comes about inevitably and naturally, and that every fact in the structure and behavior of an animal has a significant bearing upon that animal's life. In the matter of illustrations and drawings the book is unusually strong, and the absence of technical terms except when absolutely necessary makes it a thoroughly interesting book for a beginner in zoology.







PROF. F. H. KING,  
UNIVERSITY OF WISCONSIN.

[See page 124.]